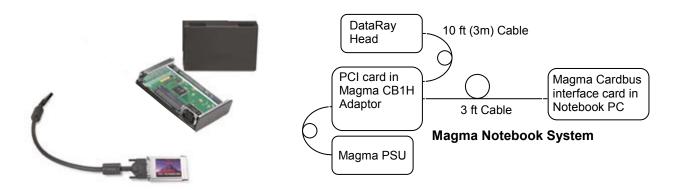
www.dataray.com

Rev. 0211A Released 25 November 2002

Magma CB1H Notebook PC interface for DataRay Products

Applies to: BeamMap, BeamMapC, Collimate, Beam'R, BeamScope-P7, WinCamD, TaperCamD

This note describes the Magma CB1H Notebook PC interface and its Installation, Operation and Troubleshooting. This is a third party unit that allows the use of DataRay (& other) PCI cards with Notebook PCs. All DataRay products now come with PCI cards.



DataRay PCI cards are ½-size or smaller & use the CB1H unit shown. (Magma also sell a CB1F for full size cards.) The Magma unit creates a supported remote PCI bus into which a PCI card may be plugged. It consists of:

- ☐ The CB1H ½-size PCI card enclosure
- ☐ Separate universal AC to DC adapter
- Cardbus host interface card that fits in your Notebook PC (Shown attached to the cable in the picture)
- 3 ft (0.9 m.) cable that connects Cardbus card to CB1H (Cable in photo is shorter)
- □ Software drivers for Windows NT4, 2000 & XP. [Not strictly required for Windows 98 or Me.]
- ☐ User's Manual [Brief but adequate]

CB1H Specifications	Subject to change without notice. Visit: www.magma.com/index2.html
Enclosure Dimensions	W x H x L 5.45 x 1.70 x 8.02 inches 140 x 44 x 204 mm (PSU is additional)
Weight	Case + PSU + cables = 4.5 lb (2 kg)
Cooling	Internal 4 CFM fan
Power supply	Input 115 - 230 VAC. Output 12 VDC. +3.3, +5 , +12 & -12 V power to PCI card.
Operating systems	Windows 98, Me, NT; 2000, XP

Supported Notebooks The Notebook PC *must* support 32-bit Cardbus. See compatibility advice & list at: www.magma.com/pci/compatibility/pdf/pc_laptop_rec.pdf

We recommend the use of a brand-name Notebook with 500 MHz or faster Pentium III or IV, ‡256 MB RAM, a CD-RW &/or a 10/100 Ethernet port for file export, XP Professional operating system preferred (but not mandatory).

<u>IMPORTANT</u>: Sony Vaio Notebook PCs and others that use the Ricoh CardBus controller are **not** supported by the Magma interface. There is no solution to this.

Pricing Guideline ~\$1,000 to \$1500 depending on th

~\$1,000 to \$1500 depending on the destination country, the purchase route, and the level of integration undertaken by DataRay or it's Rep/Distributor.

Subject to change without notice

If you purchase directly from Magma, you may forego free integration support by DataRay &/or its agents.

Installation

This process should take you about 10 to 20 minutes. If it seems that a lot of Notebook PC restarting is required, then please send your complaints to support@microsoft.com. Microsoft is the organization that decided to treat Cardbus too simplistically, especially in NT, 2000 & XP.

<u>IMPORTANT</u>: Sony Vaio Notebook PCs and others that use the Ricoh CardBus controller are **not** supported by the Magma interface. There is no solution to this.

Dell notebooks with internal modem/Ethernet may give problems ... but Magma can help you solve it. See 17) below.

Do I need to do all this? You may get lucky and have things work easily and intuitively in Windows 98 and Me, but particularly for Windows NT, 2000 and XP it is <u>STRONGLY</u> recommended that you rigorously follow the steps outlined below. If you contact us for support, the first question will be "Did you rigorously follow the instructions?" If you are hesitant in your response, you will be asked to uninstall everything and then reinstall in accordance with the instructions below.

The instructions include checks that you should carry out at each stage, in order to confirm that installation is proceeding as it should.

How it works - what you need to know:

□ Windows can support up to 256 PCI buses, up to 256 slots per bus.

Most full PC systems have one PCI bus and a few PCI slots. Notebook PC systems use an internal PCI bus equivalent, but have no standard PCI clots, unless you purchase a full docking station which includes such a slot.

The Magma Cardbus card and CB1H box adds a 'remoted' single PCI bus with a single ½-PCI slot.

- Resources are allocated to PCI buses when the Notebook PC boots up from a powered-down state.
 - **Warning**: For most Notebook PCs, **Restart** is not the same as **Shutdown** followed by a full **Start**. *Never use* **Restart**.
- □ **Hibernate**. Most Notebook PCs support a 'Hibernate mode'. In this mode the PC is powered down to a very low power consumption level, but is not turned off from a software perspective. The resource allocation to the external PCI bus in the CB1H remains in place.
- □ To detach the Magma, you must *never* simply unplug it, while the Notebook is on. To the computer, this is like ripping out the connections to a PCI bus while the PC is on. It has the PC equivalent of a fainting fit, and you will have to **Shutdown** followed by a full **Start** with the Magma re-plugged in.

To detach the Magma you will use the **Unplug or Eject Hardware** icon at bottom right of your screen (which will appear following installation), and uninstall the **DEC 21152 PCI to PCI Bridge**. Step 13) will address this.



Before you start, download the most recent version of this note from: www.dataray.com/pdf/Magma.pdf

1) Initially you will *not* put the DataRay card into the Magma. You will confirm that the Magma is working correctly before you add the DataRay card.

You will install the DataRay software *before* you install the DataRay card.

Use static-safe precautions as appropriate.

2) Connect & Power Up The Magma Chassis.

Connect the Magma CB1H to the Magma Cardbus card using the thick short cable provided. Being careful to loop the cable to avoid undue torque or strain on the connectors, insert the Magma Cardbus into the lower socket on your Notebook PC.

Socket 1. The Magma documentation states that it can be important to put the Cardbus card into Socket 1 of the Notebook. This is often, *but not always* the lower socket. Some manufacturers label the Cardbus sockets on the computer or in the computer documentation. Many do not. If it does not work in one socket, Magma suggests that you try the other. If necessary, label the card or the socket once you have worked out which it is.

When you reach Step 5) you will determine from the PC which socket you are using. No, you cannot short-circuit this process.

In order for the Notebook BIOS to correctly allocate resources when the Notebook boots up, the Magma CB1H must always be connected and powered up before the Notebook PC is powered up. DO THIS NOW, before you power up the Notebook

3) Power up the Notebook PC.

When, later on, reboots of your Notebook PC is required, <u>never</u>, <u>ever</u>, <u>use Restart</u>, nor should you ever accept a Windows offer to automatically restart your Notebook PC. Always manually use **Shutdown**, count to ten once it has shutdown and then power up again. NT, 2000 & XP can require one or two reboots before a driver will 'take' for the first time.

4) Install the Magma Drivers.

If you are using Windows 98 or Me, there is no *need* to install any Magma drivers but it *may* help. If you are using Windows NT, 2000 or XP it is necessary to install Magma drivers.

If it is a new Magma unit, use the drivers on the CD, currently (28 Oct. 2002) designated as CB03A. If you are unsure, go to **www.magma.com/support/support_utils.htm** and download the latest version of the *.zip set of drivers and utilities for your Notebook's operating system, currently win0220.zip.

We recommend that you always use the latest *.zip version from the Magma website, use Windows Explorer to create a c:\Program Files\Magma directory, unzip all the files into this directory and then finally double-click setup.exe in the directory to run the setup program.

Follow the instructions that come with the Magma unit, in case they have changed since this section of this Application Note was written.

In the **InstallShield Wizard** choose the **Modify** option and click **Next** >. This will install the drivers in the appropriate operating system directories and also install a set of files in a new directory, c:\Program Files\Magma.

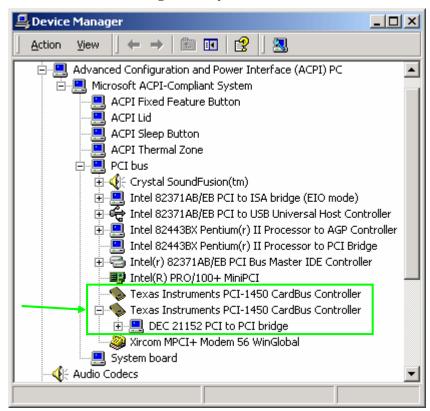
Shutdown and then start your computer, leaving the Magma unit powered up.

5) Verify that the Magma CB1H is installed and working correctly.

On the Desktop, right-click My Computer, and click Properties. In System Properties under the Hardware tab choose Device Manager. (Windows versions vary slightly on how you reach Device Manager.)

In the View menu choose Devices by connection. Click the '+' sign several times until you reach the PCI bus and then a Cardbus Controller, with a + sign next to it, in this case, and commonly, the Texas Instruments PCI-1450 Cardbus Controller.

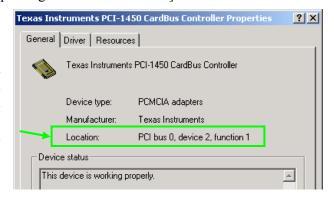
The **DEC 21152 PCI to PCI bridge** is a chip on the Magma Cardbus card. [The CB1H box itself has a DEC



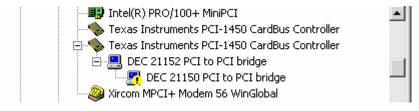
21150 chip which will be seen if you click the plus sign on the **DEC 21152**.]

Check the Cardbus Slot Number.

Right-click on the **Cardbus Controller** and click on **Properties** to see the screen shown right. In **Location:**, the **function** number, in this case **1**, is the Cardbus Slot number. **1** is what you want to see here, not **0**. If you see a **0**, then power down the PC, return to Step 2) and change the Magma card to the other slot.



Exclamation Mark ! If you see an exclamation mark on the DEC 21152 PCI to PCI bridge, or the DEC 21150 PCI to PCI bridge this



means that it is not correctly installed. Double-click the problem bridge to see the **Properties** screens, and choose the **Driver** tab. Click **Uninstall**.

In **c:\Program Files\Magma** double-click **cb.exe** which uninstalls and then reinstalls the drivers. If the Magma is still not correctly installed go to Step 18) in **Troubleshooting**, below.

6) Install the iDataRay.exe software

Install the DataRay software on the Notebook PC *before* your install the DataRay PCI card in the Magma CB1H. Carefully follow the instructions in the relevant DataRay product User Manual and in any software, manual or installation instruction updates at the website.

7) Install the DataRay card.

Power down the PC and the Magma CB1H. Using static-safe procedures, install the DataRay PCI card in the CB1H chassis. With BeamMap and BeamScope-P7 series cards, take care to line up the small gap between the heatsink and the card with runner on the Magma. Power up, first the Magma and then the PC.

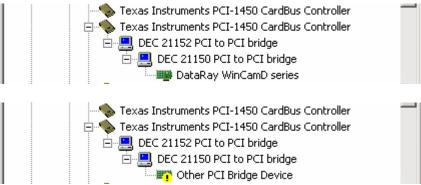
The **New Hardware Found** Wizard may/should appear. If you are unfamiliar with use of this Wizard, follow the instructions in the DataRay User Manual. You need to direct it to find the *.inf that you installed earlier. If it suggests c:\Program Files\DataRay as the source, then that is also fine.

Once it has installed, verify that it is correctly installed in **Device Manager**. In the **View** menu choose **Devices by connection**. You are hoping to get the screen result shown below.

It will say **DataRay WinCamD**, **BeamMap** or **BeamScope series** depending on the type of DataRay card that you have installed.

If all is fine, proceed to step 9). If instead you see the screen below with an exclamation mark over the DataRay card, then it is not properly installed.

In this case, right-click the card with the exclamation mark and click **Uninstall...**. In the **Action** menu choose



Scan for hardware changes. Repeat stage 7). If you are unsuccessful proceed to Troubleshooting.

8) Try the software / Restart the PC.

Try the DataRay software, being careful to choose the correct instrument in the **Device** pull-down menu. Click your way through any messages, but note them down for possible future reference. If you get a message: **Driver not loaded. Try one reboot**, then power down and then restart the PC.

Is the instrument working? If it is, congratulations. You have successfully completed installation. Go to Step 9).

If everything seems fine but the software does not work proceed to **Troubleshooting**.

Operation

- 9) Once the unit is operating correctly, there are no special DataRay software issues or limitations associated with use of the Magma unit.
- 10) Remember to *always* connect and power up the Magma unit *before* the Notebook PC is powered up. This is because on Windows 2000 and later operating systems, the BIOS allocates resources to the PCI cards during the boot process. If the Magma is not powered up, then the BIOS cannot find the PCI card and does not allocate resources.
- 11) Do not power down the CB1H or remove the Magma Cardbus card before the Notebook PC has been turned off, or while the PC is in hibernate/sleep mode. If you do, at a minimum you will have to go to step 13), and may need to go through steps 5) through 8) again.

Magma Cardbus Card Removal

12) To remove the Magma card, you must never merely unplug it, either while the Notebook is on or off.

You should use the **Unplug or Eject Hardware** icon at bottom right of your screen, and uninstall the **DEC 21152 PCI to PCI Bridge**.

No icon present?

If there is no icon present there, you may alternatively go Start, <u>Settings</u>, <u>Control Panel</u>, Add/Remove Hardware, and use the <u>Uninstall/Unplug</u> a device, followed by the <u>Unplug/Eject</u> a device. Towards the end of the wizard, you will get the chance to install the <u>Unplug</u> or <u>Eject Hardware</u> icon for future use.

If you then shut down the computer and power it up again, it should work fine.

- 13) *If you do not do this*, but merely remove the card once everything has been turned off, then some Notebooks will freeze when trying to boot into Windows. The solution is to shutdown, insert the Magma Cardbus card, and then restart everything. Then, in the future, follow 12) above.
- 14) **Good news**. Once a Magma has been successfully installed, while the Notebook is on, you may plug in the Cardbus and the Magma starts working immediately.

Even better news. Once any DataRay card has been installed and is working properly, with Version 4.06H and higher of the DataRay software, any other DataRay card placed in the Magma will install automatically.

Troubleshooting

15) Magma no working.

If it does not work, you first action is to reread the instructions and see if you accidentally skipped something. If you did not then proceed to Step 19).

16) Magma still not working.

If your Notebook PC went into Hibernation/Sleep mode then, when you brought it out of hibernation, the Magma system did not work, **Shut down** the Notebook PC, count to ten once it has shutdown and then power up again.

17) **Dell Notebooks**. If you have a Dell Notebook with an internal Ethernet/modem, than it is quite possible that you are having problems. Magma can help you with this, but you will need to contact them so that they can walk you through the solution: www.magma.com

18) Exclamation Mark persisting.



If the problem is that you cannot get rid of the exclamation mark on the **DEC 22152**, Step 6), then the most likely reason is that two required Magma drivers are not in the right directory. Look in Windows Explorer at the path c:\WINNT\system32\drivers.

In Windows 2000, you should find the files, mrtcb.sys and premrt.sys, in:

c:\WINNT\system32\drivers

c:\WINNT\system32\drivers\win2k

In Windows XP, you should find the files, MRTCB.SYS and PREMRT.SYS, in:

c:\Windows\system32\drivers

c:\Windows\system32\drivers\winxp

Manually locate the two drivers in c:\Program Files\Magma\win2k or in c:\Program Files\Magma\win2k as appropriate, and move then into the ...\drivers directory above.

Then repeat steps 5) and 6) and see if things are working better. If not, go to Step. 19).

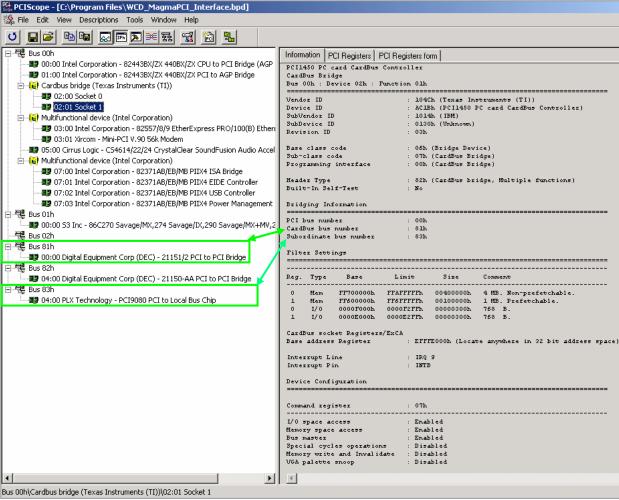


19) Diagnostic Utilities:

PCIScope. In order to find out and record which socket you are using and details on the allocated resources, you may run also run PCI Scope, the <u>extremely useful utility</u> included on the Magma CD as **PC/Pc Utilities/pciscope.exe**. [A license for use beyond the trial period is ~\$60 from Apsoft].

Save the data as a *.bpd file in the c:\Program Files\Magma directory.

On the screen below, you find an example taken on an IBM T20 ThinkPad. Note that bus numbers will be different on other machines, and may even change on the same machine following a



reinstallation.

- Left clicking the blue-highlighted 02:01 Socket 1 shows data for the Cardbus socket containing the Magma card.
- The gray area on the right shows information for **Socket 1**. The upper green arrow connects the **Cardbus bus number**: **81h** to the ... **DEC 21151/2 PCI to PCI Bridge** highlighted in the green outlined box. This corresponds to a chip in the Magma Cardbus card that is installed in your Notebook PC Cardbus socket.
- The lower green arrow connects the **Subordinate box number**: 83h to the ... PLX **Technology** ... highlighted in the green outlined box. This corresponds to the interface chip on the DataRay WinCamD PCI card installed in the Magma CB1H unit.

DBGView

From c:\Program Files\Magma, run dbgview.exe, and while its screen is open run dump.exe from the same directory. This will fill the dbgview screen. Save and appropriately name the resulting *.log file in the c:\Program Files\Magma directory. N.B. If the drivers noted in Step 18) above are not loaded then dbgview may remain empty.

Email the *.bpd and *.log files to your local distributor/rep or to support@dataray.com, together with a note detailing your Notebook PC type and Windows operating system. See Step 20).

20) Contact DataRay support.

For any other problems contact your local rep/distributor, or support@dataray.com

See Call/Contact us numbers and email addresses at www.dataray.com.

If you contact us for support, the first question will be "Did you rigorously follow the instructions?" If you are hesitant in your response, you will be asked to uninstall everything and then reinstall in accordance with the instructions.